

**WASHINGTON STATE DEPARTMENT OF ECOLOGY
POST OFFICE BOX 47600
OLYMPIA, WASHINGTON 98504-7600**

IN THE MATTER OF:]	NO. PSD-01-04
Puget Sound Energy]	
Fredonia Power Generating Station]	FINAL APPROVAL OF PREVENTION OF
P.O. Box 97034, OBC-14N]	SIGNIFICANT DETERIORATION APPLICATION
Bellevue, Washington 98009-9734]	

Pursuant to the United States Environmental Protection Agency (EPA) regulation for the Prevention of Significant Deterioration (PSD) set forth in Title 40, Code of the Federal Regulations (CFR), 40 CFR Part 52.21, and regulations set forth in the Washington Administrative Code 173-400-141 and based upon the PSD application submitted by Puget Sound Energy (PSE) on May 7, 2001, the additional information submitted on October 5 and October 23, 2001, June 13 and December 3, 2002, January 3 and March 14, 2003, and the technical analysis performed by the Department of Ecology (Ecology). Ecology determined the application to be complete on March 14, 2003. Following all the information submitted by PSE, Ecology now finds the following:

FINDINGS

1. PSE proposes to install and operate two Pratt & Whitney FT-8 Twin Pac simple-cycle combustion turbines at the Fredonia Generating Station (FGS). PSE currently refers to these combustion turbines as "Fredonia Generating Station Turbine 3 and Turbine 4." The turbines may use either natural gas or distillate fuel. Each turbine has the capability to supply a gross power output of approximately 54 MW. PSE has an Administrative Order on Consent (signed April 6, 2001), which grants PSE permission to construct and operate two turbines prior to obtaining a PSD permit.
2. FGS is located in Skagit County, Washington near the City of Mt. Vernon (48°27'17" N latitude, 122°26'14").
3. The site of the proposed project is within a Class II area that is in attainment with regard to all pollutants regulated by the National Ambient Air Quality Standards (NAAQS).
4. The five Class I areas closest to the Fredonia generating facility are identified in the table, below.

Class I Area	Approximate Distance from Facility, km
North Cascade National Park	68
Glacier Peak Wilderness	75
Olympic National Park	78
Pasayten Wilderness	110
Alpine Lakes Wilderness	129

5. This project is subject to New Source Performance Standards (NSPS): Subpart GG (Standards of Performance of Stationary Gas Turbines).
6. The emissions of all air pollutants from the proposed modification are subject to review under Chapter 173-400 WAC, Chapter 173-460 WAC, and the regulations of the Northwest Air Pollution Authority (NWAPA). Chapter 173-400 WAC includes provision for PSD review (WAC 173-400-141). This permit considers only PSD applicable issues. All other air quality related notice of construction approval issues are subject to NWAPA's authority.
7. FGS currently has the potential to emit more than 250 tons per year of a pollutant that is subject to the federal Clean Air Act. This qualifies FGS as an existing major stationary source as defined in federal regulations 40 CFR Part 52.21(b)(1)(i)(b).
8. The project will use natural gas and/or distillate fuel as the turbines' fuels.
 - 8.1 The project may use low-sulfur distillate fuel having not greater than 0.032% sulfur by weight until the inventory of such fuel existing at the time of issuance of this permit has been consumed by all fuel-burning equipment at or otherwise removed from the Fredonia Generating Station.
 - 8.2 Use of distillate fuel having greater than 0.01% sulfur-content by weight is prohibited during the months of May through July in any year.
 - 8.3 Distillate fuel having a sulfur content not greater than 0.01% by weight may be used at any time.

9. The Best Available Control determinations are shown in the table, below:

Pollutant	BACT	Emissions Concentration	Annual Emissions, tons per year (TPY)	PSD Significance Level TPY
Nitrogen oxides (NO _x)	Selective Catalytic Reduction	5 parts per million on a dry volumetric basis (ppmdv) at 15% O ₂	102	40
Sulfur oxides as sulfur dioxide (SO ₂)	Low sulfur fuels (natural gas and 0.01% sulfur distillate fuel, see Finding 8, above)	1.5 ppmdv at 15% O ₂	45	40
Sulfuric acid mist (H ₂ SO ₄)	Low sulfur fuels (natural gas and 0.01% sulfur distillate fuel, see Finding 8, above)	Daily limit is 176 lbs.	32	7
Particulate matter smaller than 10 microns (PM/PM ₁₀)	Clean burning fuel and good combustion practice	0.01 grains/dry standard cubic foot (gr/dscf)	272	15

10. The proposed net increases in potential emissions from this project for NO_x, SO₂, H₂SO₄, and PM/PM₁₀ are each above the corresponding PSD significance levels. All are subject to review under PSD.
11. Allowable emissions from the new emissions units are below modeling significance for all pollutants, and therefore, will not cause or contribute to air pollution in violation of:
 - 11.1 Any ambient air quality standard;
 - 11.2 Any applicable maximum allowable increase over the baseline ambient concentration.
12. Ambient impact analysis indicates that pollutant deposition on soils and vegetation in any of the surrounding Class I areas will not exceed 60% of federal land manager criteria for significance.
13. Ambient impact analysis indicates that degradation of regional visibility, or impairment of visibility in any Class I areas from the proposed emissions will not exceed 75% of federal land manager criteria for concern.
14. No significant effect on industrial, commercial, or residential growth in the Fredonia/Skagit County area is anticipated due to the project.
15. Pursuant to requirements under the April 6, 2001 Administrative Order on Consent, PSE

completed several compliance tests and has been continuously monitoring NO_x and CO since operation startup in July 2001. Ecology has determined that these compliance demonstration and relative accuracy tests on the continuous monitoring systems satisfy the following initial compliance demonstrations listed in the Approval Conditions, below:

15.1 Conditions 5 .

15.2 Condition 8 on both turbines for natural gas and on FGS Turbine #3 for distillate fuel.

15.3 Condition 11 on FGS Turbine #3.

15.4 Condition 14 for natural gas

16. Pursuant to requirements under the April 6, 2001 Administrative Order on Consent, PSE satisfied Condition 29 prior to finalization of this PSD permit.

17. Ecology finds that all requirements for PSD application are satisfied and that as approved below, the new emissions units comply with all applicable federal new source performance standards. Approval of the PSD application is granted subject to the following conditions:

APPROVAL CONDITIONS

1. Definitions:

1.1 Unless otherwise indicated, "turbine" or "turbines" in this permit shall mean the turbines designated at the time of issuance of this permit as Fredonia Generating Station Turbine 3 and/or Turbine 4.

1.2 "Low-sulfur distillate fuel" shall mean distillate fuel having not greater than 0.01% sulfur content by weight.

1.3 The 60 day deadline for initial compliance demonstration using distillate fuel referred to in Conditions 5.1, 1, 8.1, 11.1, and 14.1 shall not be counted as including days in May, June, or July.

2. The turbines shall be fueled only with natural gas and/or distillate fuel:

2.1 Distillate fuel having more than 0.01% and not more than 0.032% sulfur by weight may be used subject to the following:

2.1.1 May be used in Fredonia Generating Station Turbine 3 or Turbine 4 only during the months of January through April and August through December of any year.

2.1.2 May not be used in Fredonia Generating Station Turbine 3 or Turbine 4 after a total of 2,900,000 gallons of said fuel have been consumed by all fuel-burning equipment at the Fredonia Generating Station or otherwise removed from the facility.

2.2 Low-sulfur distillate fuel may be used at any time.

3. NO_x emissions from each turbine exhaust stack shall not exceed 5.0 parts per million on a dry volumetric basis (ppmdv) over a three hour average when corrected to 15.0 percent oxygen.

4. NO_x emissions from each turbine exhaust stack shall not exceed

- 123 4.1 290.4 pounds (132 kg.) per day.
- 124 4.2 51 tons (46,266 kg.) in any consecutive twelve month period.
- 125 5. Initial compliance for Condition 3 at each turbine exhaust stack.
- 126 5.1 Initial compliance shall be demonstrated for operation on both natural gas and distillate
127 fuel not later than 60 days after the date this permit has become final.
- 128 5.2 PSE will submit a test plan to Ecology and NWAPA for approval at least 30 days
129 prior to initial performance testing.
- 130 5.3 Initial compliance testing:
- 131 5.3.1 Shall be in accordance with EPA Reference Method 20, except that the
132 instrument span shall be 50 ppm or less.
- 133 5.3.2 Shall be conducted consistent with the requirements in 40 CFR Part 60.335
- 134 6. Compliance with NO_x emissions limits from each turbine exhaust stack:
- 135 6.1 Compliance with Condition 3 shall be monitored by a Continuous Emission Monitor
136 (CEM) for NO_x and oxygen (O₂) that meets the requirements of Approval Condition
137 16.
- 138 6.2 The CEM for NO_x shall be operated during startup and shutdown periods.
- 139 6.3 Compliance for Conditions 4.1 and 4.2 shall be monitored using the emissions data
140 monitored pursuant to Condition 6.1.
- 141 6.3.1 Mass emission rates will be determined using the appropriate procedures
142 outlined in 40 CFR Part 60 Appendix A Method 19.
- 143 6.3.2 An equivalent mass emission rate calculation method may be used if approved
144 in advance by Ecology.
- 145 6.3.3 Emissions data shall be converted to pounds NO_x per day for monitoring
146 Condition 4.1 compliance.
- 147 6.3.4 Emissions data shall be converted to tons NO_x per year (TPY) for monitoring
148 Condition 4.2 compliance.
- 149 7. SO₂ emissions from each turbine exhaust stack:
- 150 7.1 When burning distillate fuel having more than 0.01% sulfur by weight:
- 151 7.1.1 Shall not exceed 5 ppm_{dv} corrected to 15.0 percent oxygen, one-hour average.
- 152 7.1.2 Shall not exceed 17 pounds (7.7 kg.) per hour.
- 153 7.2 When burning natural gas or low-sulfur distillate fuel:
- 154 7.2.1 Shall not exceed 1.5 ppm_{dv} corrected to 15.0 percent oxygen, one-hour
155 average.
- 156 7.2.2 Shall not exceed 5.1 pounds (2.3 kg.) per hour.
- 157 8. Initial compliance for SO₂ at each turbine stack:

- 158 8.1 Shall be demonstrated for operation on both natural gas and distillate fuel not later than
159 60 days after the date this permit has become final.
- 160 8.2 PSE will submit a test plan to Ecology and NWAPA for approval at least 30 days
161 prior to initial performance testing.
- 162 8.3 Initial compliance testing for Condition 7:
- 163 8.3.1 Shall be in accordance with EPA Reference Method 20
- 164 8.3.2 The instrument span shall be 3 ppm or less.
- 165 8.3.3 All span and calibration gases used shall follow in accordance with the
166 method requirements.
- 167 8.3.4 The initial compliance test shall be conducted consistent with the requirements
168 in 40 CFR Part 60.335.
- 169 8.3.5 Initial compliance demonstration with Condition 7.1.1 will satisfy the initial
170 compliance demonstration for Condition 7.2.1 for use of low-sulfur distillate
171 fuel.
- 172 8.4 Initial compliance for Condition 7.1.2 and 7.2.2 will be determined from the arithmetic
173 mean of the SO₂ emissions source test results pursuant to Condition 8.3, converted to
174 lbs. SO₂ per hour.
- 175 8.4.1 Mass emission rates will be determined using the appropriate procedures
176 outlined in 40 CFR Part 60 Appendix A Method 19.
- 177 8.4.2 An equivalent mass emission rate calculation method may be used if approved
178 in advance by Ecology.
- 179 8.4.3 Initial compliance demonstration with Condition 7.1.2 shall satisfy the initial
180 compliance demonstration for Condition 7.2.2 for use of low-sulfur distillate
181 fuel.
- 182 9. Continuous emission monitoring of SO₂ is not required.
- 183 9.1 Continuous compliance with the limit for each of the stacks shall be by means of fuel
184 sulfur content reporting and fuel flow monitoring to each turbine consistent with 40
185 CFR Part 75, Appendix D, or
- 186 9.2 By an alternative fuel monitoring schedule that has been approved by USEPA.
- 187 10. H₂SO₄ emissions from each turbine exhaust stack shall:
- 188 10.1 Shall not exceed 310 pounds (140 kg.) per day when burning distillate fuel having
189 more than 0.01% sulfur-content by weight:
- 190 10.2 Shall not exceed 88 pounds (40 kg.) per day when burning natural gas or low-sulfur
191 distillate fuel.
- 192 11. Initial compliance for H₂SO₄ at each turbine stack:
- 193 11.1 Shall be demonstrated for operation on distillate fuel not later than 60 days after the
194 date this permit has become final.

- 11.2 PSE will submit a test plan to Ecology and NWAPA for approval at least 30 days prior to initial performance testing.
- 11.3 Initial compliance testing for Condition 10 shall be by EPA Reference Method 8 with incorporation of the procedures given in EPA Reference Method 6, Section 7.3 for elimination of ammonia interference, or an equivalent method approved in advance by Ecology or NWAPA.
- 11.4 Mass emission rates will be determined using the appropriate procedures outlined in 40 CFR Part 60 Appendix A Method 19 as modified for H₂SO₄.
- 11.5 An equivalent mass emission rate calculation method may be used if approved in advance by Ecology.
- 11.6 Initial compliance demonstration with Condition 10.1 will satisfy the initial compliance demonstration for Condition 10.2 for use of low-sulfur distillate fuel.
12. Emissions of particulate matter less than 10 micron diameter (PM₁₀) from each turbine exhaust stack shall not exceed 0.01 gr/dscf corrected to 15.0 percent oxygen one-hour average.
13. PM₁₀ emissions from each turbine exhaust stack shall not exceed 31.0 pounds (14.1 kg.) per hour.
14. Initial compliance for PM₁₀ emissions for each turbine exhaust stack:
- 14.1 Shall be demonstrated for operation on both natural gas and distillate fuel not later than 60 days after the date this permit has become final.
- 14.2 PSE will submit a test plan to Ecology and NWAPA for approval at least 30 days prior to initial performance testing.
- 14.3 Initial compliance testing for Condition 12 shall be by either EPA Reference Methods 5, 201, or 201A, plus Reference Method 202 or an equivalent method agreed to in advance by Ecology or NWAPA. Paragraph 2.2 of Reference Method 202 may be adapted to sulfates to account for ammonia interference.
- 14.4 Initial compliance for Condition 13 will be determined from the arithmetic mean of the PM₁₀ emissions source test results pursuant to Condition 14.3, converted to lbs. PM₁₀ per hour.
- 14.4.1 Mass emission rates will be determined using the appropriate procedures outlined in 40 CFR Part 60 Appendix A Method 19.
- 14.4.2 An equivalent mass emission rate calculation method may be used if approved in advance by Ecology.
15. Compliance with H₂SO₄ and PM₁₀ emissions limits from each turbine exhaust stack shall be monitored by source testing.
- 15.1 Source test methodology shall be the same for each respective pollutant as specified for initial compliance testing in Conditions 11, and 14 or equivalent methods agreed to in advance by Ecology or NWAPA.
- 15.2 Source testing shall be conducted not less frequently than annually until three

consecutive annual tests are in compliance with a specific pollutant's (H_2SO_4 or PM_{10}) emission limitations.

15.2.1 Source testing frequency for H_2SO_4 or PM_{10} can be reduced to once every three years if the immediately previous three years' source test results have demonstrated compliance with each respective emissions compliance condition, and if agreed to in writing by Ecology or NWAPA.

15.2.2 If a source test for H_2SO_4 or PM_{10} indicates noncompliance with the respective emissions compliance condition, the frequency of testing for the aberrant pollutant will return to Condition 15.2.

16. Continuous Emission Monitoring Systems: CEMS for NO_x , O_2 , and (if used) exhaust gas flow rate compliance shall meet the requirements contained in 40 CFR 75, Emissions Monitoring.

17. Recordkeeping:

17.1 PSE shall retain the following records for each turbine for a period of five years:

17.1.1 Quarterly and annual (year to date) quantity summations of each type of fuel used and corresponding heat input rates.

17.1.2 Results from

17.1.2.1 All fuel sulfur analyses.

17.1.2.2 All fuel nitrogen analyses

17.1.2.3 All stack emissions tests.

17.2 Results of any monitor audits or accuracy checks.

17.3 The duration and nature of any monitor down time.

17.4 The date and time period that each turbine operates, with totals of daily, quarterly and annual hours of operation

17.5 PSE shall record the following for all times of operation:

17.5.1 Hourly average NO_x concentrations pursuant to Conditions 3.

17.5.2 NO_x mass emissions pursuant to Condition 4.

17.6 PSE shall have these records readily available for NWAPA and Ecology inspection upon request.

18. Reporting:

18.1 Quarterly to Ecology or NWAPA (unless a different testing and reporting schedule has been approved by Ecology or NWAPA) within thirty days of the end of each calendar quarter:

18.1.1 CEMS, stack test, and process data pursuant to Conditions 17.1 through 17.5 shall be reported in written (or electronic if permitted by Ecology or NWAPA) form.

18.1.2 Certification by the responsible party for the facility that the relevant

- 271 equipment was operated and maintained in accordance with the operational
272 parameters and practices developed pursuant to Condition 19.
- 273 18.1.3 Beginning with the issuance date of this permit and until 2,900,000 gallons of
274 distillate fuel having more than 0.01% sulfur-content by weight has been
275 consumed by all fuel-burning equipment at the Fredonia Generating Station or
276 otherwise removed from the facility,
- 277 18.1.3.1 Quarterly and total-to-date summations of the quantity of all
278 distillate fuel used in Fredonia Generating Station.
- 279 18.1.3.2 Quantity of distillate fuel having more than 0.01% sulfur-content by
280 weight in inventory at the Fredonia Generating Station
- 281 18.2 For parameters subject to monitoring under the Title IV Acid Rain program, the
282 reporting requirements shall be in accordance with the requirements of that program.
- 283 18.3 Each occurrence of monitored emissions in excess of the standard shall be reported in
284 accordance with the requirements of WAC 173-400-107(3) [effective 9/20/93], and
285 shall include the following:
- 286 18.3.1 For parameters subject to monitoring under the Title IV Acid Rain program,
287 the reporting requirements shall be in accordance with the requirements of
288 that program in addition to elements indicated in Condition 18.3.2, below.
- 289 18.3.2 For all pollutants:
- 290 18.3.2.1 The time of the occurrence.
- 291 18.3.2.2 Magnitude of the emission or process parameters excess.
- 292 18.3.2.3 The duration of the excess.
- 293 18.3.2.4 The probable cause.
- 294 18.3.2.5 Corrective actions taken or planned.
- 295 18.3.2.6 Any other agency contacted.
- 296 19. A site-specific operating and maintenance (O&M) manual for the Pratt & Whitney FT-8
297 Twin Pac simple-cycle dual-fuel fired combustion turbines installed pursuant to this permit
298 shall be developed and shall at a minimum include:
- 299 19.1 Manufacturers' operating instructions and design specifications shall be included in
300 the manual.
- 301 19.2 Normal operating parameters and design specifications.
- 302 19.3 Maintenance schedule and procedures.
- 303 19.4 Updates to reflect any modifications of the equipment or its operating procedures.
- 304 19.5 Copies of the manuals available at the facility for Ecology or NWAPA.
- 305 20. This approval shall become invalid if
- 306 20.1 Construction of the project is not commenced prior to eighteen (18) months after
307 receipt of the final approval, or if

20.2 Construction of the facility is discontinued for a period of eighteen (18) months.

20.3 PSE may extend the 18 month period upon satisfactorily showing that an extension is justified, pursuant to 40 C.F.R. 52.21(r)(2) and applicable EPA guidance.

21. Sampling ports and platforms shall be provided on each stack, after the final pollution control device. The ports shall meet the requirements of 40 CFR, Part 60, Appendix A Method 20.

22. Adequate permanent and safe access to the test ports shall be provided. Other arrangements may be acceptable if approved by Ecology or NWAPA personnel prior to or during installation.

23. Any activity that is undertaken by the PSE Fredonia Power Generation Facility or others, in a manner which is inconsistent with the application and this determination, shall be subject to Ecology or NWAPA enforcement under applicable regulations. Nothing in this determination shall be construed so as to relieve PSE Fredonia Power Generation Facility of its obligations under any state, local, or federal laws or regulations.

24. The PSE Fredonia Power Generation Facility shall notify Ecology and NWAPA in writing at when the first electricity from that turbine is delivered to the electrical power grid.

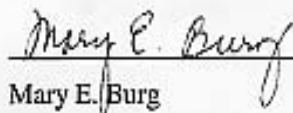
25. Access to the source by Ecology and NWAPA or the authorized representative of Ecology and NWAPA shall be permitted upon request for the purpose of compliance assurance inspections. Failure to allow access is grounds for revocation of this determination of approval.

Reviewed by:


Bernard Brady, P.E.
Technical, Information, and Engineering Services
Air Quality Program
Washington Department of Ecology

Date July 16, 2003


Approved by:


Mary E. Burg
Program Manager, Air Quality Program
Washington State Department of Ecology
Date 18 July 2003